**Annual Lesson Plan- 2021-2022**

**SUBJECT: BIOLOGY**

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| **MONTH** | **CHAPTER** | **DETAIL CONCEPTS TO BE COVERED** | **ACTIVITY** |
| APRIL | **CHAPTER 1**  **CHAPTER 2**  **CHAPTER 3**  **CHAPTER 4** | Reproduction in organisms- asexual and sexual, vegetative propagation, pre fertilisation, fertilisation and post fertilisation events; development of male/female gametophyte, pollination, double fertilisation, post fertilisation events. Seed development. Male/female reproductive system, testis and ovary, Spermatogenesis. Oogenesis, menstrual cycle, fertilisation, embryo development, implantation, pregnancy, parturition. Need for reproductive health and prevention of sexually transmitted diseases (STD); Birth control – Need and Methods, Contraception and Medical Termination of Pregnancy (MTP); Amniocentesis. Infertility and assisted reproductive technologies. Mendelian Inheritance; Incomplete dominance. Co-dominance, Multiple alleles and Inheritance of blood groups, Pleiotropy. | AIL |
| JUNE | **CHAPTER 5**  **CHAPTER 6** | Elementary idea of polygenic inheritance; Chromosome theory of inheritance; Chromosomes and genes; Sex determination - in humans, birds, honey bee; Linkage and crossing over; genetic Disorders. Genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; Transcription | - |
| JULY | **CHAPTER 6**  **CHAPTER 7**  **CHAPTER 11** | Genetic code, translation; Gene expression and regulation - Lac Operon; human genome project; DNA fingerprinting. Origin of life; Biological evolution and evidences for biological, Darwin's contribution, Mechanism of evolution - Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection; Gene flow and genetic drift. Hardy - Weinberg's principle; Adaptive Radiation; Human evolution. Genetic engineering (Recombinant DNA technology). | AIL |
| AUGUST | **CHAPTER 11**  **CHAPTER 12**  **CHAPTER 8**  **CHAPTER 9** | Application of Biotechnology in health and agriculture: Human insulin and vaccine production, gene therapy; Genetically modified organisms-Bt crops; Transgenic Animals; bio safety issues, Bio piracy and patents. Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ring worm). Basic concepts of immunology – vaccines. Cancer, HIV and AIDs; Adolescence, drug and alcohol abuse. Household, industrial and medical products from Microbes  Strategies to improve farming, apiculture, agriculture, organic farming, Hybrid plants. Tissue culture. | AIL |
| SEPTEMBER | **CHAPTER 10**  **CHAPTER 13**  **CHAPTER 14** | Organisms and environment: Habitat and niche, Population and ecological adaptations; Population interactions-mutualism, competition, predation, parasitism; Population attributes growth, birth rate and death rate, age distribution.  Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy; nutrient cycles (carbon and phosphorous); ecological succession; | - |
| OCTOBER | **CHAPTER 15**  **CHAPTER 16** | Ecological services - carbon fixation, pollination, seed dispersal, and oxygen release (in brief).  Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks, sanctuaries. Air pollution and its control; water pollution and its control; agrochemicals and their effects; solid waste management; radioactive waste management; greenhouse effect and climate change; ozone layer depletion; deforestation; any one case study as success story addressing environmental issue(s). | AIL |